C.6 OPERATIONAL PHASE TECHNICAL REQUIREMENTS

This section contains the technical requirements for the operation and maintenance of the Contractor's remediation facility as defined in Section C.3.2.3. Submittals to be provided by the Contractor in addressing these technical requirements are identified in Section C.6.3 and Figure C.4-1.

C.6.1 Elements of Operational Phase

- Maintenance of Existing Facilities (C.6.2.1);
- Waste Retrieval and Transfer (C.6.2.2);
- Mixing (C.6.2.3);
- Stockpiling/Interim Storage (C.6.2.4);
- Segregation (C.6.2.5);
- Access Control to Radiation/Contamination Areas (C.6.2.6);
- Size-Reduction (C.6.2.7);
- Waste Transferring and Handling (C.6.2.8);
- Waste Treatment (C.6.2.9);
- Waste Packaging for Transportation and Disposal (C.6.2.10);
- Contingency Planning and Emergency Response (C.6.2.11);
- Maintenance (C.6.2.12);
- Environmental Controls (C.6.2.13);
- Sampling and Analysis (C.6.2.14); and
- Shutdown (C.6.2.15).

C.6.2 Technical Requirements for Operation and Maintenance (O&M)

The following technical requirements correspond, in general, to the unit operations from the design effort discussed in Section C.5.

C.6.2.1 Maintenance of Existing Facilities

Existing facilities include those government-owned facilities which currently are, or will be, located within the Contractor's work area at the time of authorization to mobilize. At authorization to mobilize, the Contractor shall maintain these facilities in accordance with the requirements identified in this section.

A plan for maintenance of these existing facilities shall be developed by the Contractor and submitted for approval by FDF, with approval required prior to authorization to mobilize (Section C.6.3.2). This plan shall identify the procedure(s) to be used by the Contractor to maintain these facilities and shall become a part of the Contractor's overall Remedial Design Package and Maintenance Plan, discussed in Sections C.5.1.4 and C.6.3.2. These plans may be revised as necessary to accommodate the changing site conditions. Plans shall be submitted to FDF upon modification.

C.6.2.1.1 Silo 3

Silo 3 shall be inspected and maintained by the Contractor per the requirements identified below. The Contractor shall perform these activities until it demobilizes from the site.

Inspections

The Contractor shall perform weekly inspections on Silo 3. The Contractor shall record the observations from each inspection in an Inspection Log, such as that provided in Attachment W of Attachment J.4.38, and submit a copy to FDF within five working days of the inspection. The Inspection Log shall identify items found during the inspection, actions taken to correct unacceptable items found during the inspection, and/or provide a plan for undertaking such corrective actions.

In addition to the weekly inspections, the Contractor shall perform daily inspections of Silo 3 structural integrity during periods when work is being performed on the silo. The Contractor shall record observations from each inspection in an Inspection Log, such as that provided in Attachment W of Attachment J.4.38. Any unacceptable items observed during inspection shall be reported immediately to FDF for corrective actions

Silo 3 Maintenance

The Contractor, using assigned FDF maintenance personnel and with FDF acceptance, shall undertake the required maintenance needed to rectify any unacceptable findings from the inspection. Any items deemed unacceptable during the inspection which pose an imminent hazard, or where a hazard has already occurred, shall be immediately corrected by the Contractor. The Contractor shall make efforts to correct all other deficiencies within five working days of the inspection.

C.6.2.1.2 Silo 3 Dome

The Contractor shall not exceed the load limits for the Silo 3 dome as specified in Section C.3.2.1.2 and Attachment J.4.64.

C.6.2.1.3 Stormwater Management System

Existing stormwater control facilities are shown on Figure C.5-2. As referenced in Section C.4.3.1, the project work zone will be regraded prior to construction.

Limited stormwater control facilities will be provided to the Contractor for the collection of stormwater from the Contractor's process facility location (Figure C.5-2). The Contractor, using assigned FDF maintenance personnel, shall maintain this system until project completion.

The Contractor shall maintain project drainage ditches, ensuring that run-off does not exceed the stormwater system design parameters. Controls shall be implemented to minimize silt in the run-off, and the ditches shall be adequately dredged to facilitate proper drainage.

C.6.2.1.4 Roadways

The Contractor shall maintain any existing roads within its work area, identified on Figure C.1-5 and discussed in Section C.4.2.2.2.

C.6.2.1.5 Support Facilities

The Contractor shall be responsible for housekeeping using FDF/FAT&LC personnel in the change out trailers (showers), break trailers, control points, toilet trailers, etc. (Section C.4.2.2.1).

C.6.2.2 Waste Retrieval and Transfer

Waste retrieval shall consist of the complete removal of material from Silo 3. All material adhering to the sides and floor of the Silo 3 interior shall be removed. The Contractor shall provide a means to visually verify that walls and floor of Silo 3 are visibly free of material per Section C.3.2.3.6. The Contractor shall provide the necessary means for FDF to verify by visual or closed circuit television (CCTV) inspection.

As discussed in Section C.3.2.3.1, there exists the possibility of "nontypical waste" (e.g., foreign objects such as PPE, tools, gaskets, etc.) to be mixed with the material in Silo 3. Nontypical waste not amenable to the primary method of treatment shall be segregated per the MSCC and turned over to FDF for disposition. In addition, wet (or partially solidified) material may also be encountered. Based upon observation of Silo 4, located adjacent to Silo 3, the possibility exists for the bottom foot of Silo 3 material to be saturated with water. The Contractor shall include provisions for managing and size reducing these elements of waste retrieval in the design of the waste retrieval system prior to treatment.

Since a large fraction of radioactive particulate in the material may be in the sub-micron particle size range, waste retrieval systems containing Silo 3 material, including equipment, systems, structures, vessels, pipes, and hoses shall be maintained or operated in an enclosure at a negative pressure during normal operating conditions (Section C.5.1.1.3.1). This requirement may be relieved during system maintenance upon written approval by FDF. Refer to Section J.2 and Attachments J.4.30 and J.4.44 for information regarding the physical characteristics of the Silo 3 material.

Airborne emissions shall be minimized or eliminated during waste retrieval by meeting the criteria in OAC 3745-31-05, which includes the use of BAT to control emissions (Attachments J.4.1 and J.4.2, and Section C.5.1.1.3.1).

Waste retrieval shall be done using pneumatic and/or mechanical means (Alternative means of waste retrieval may be proposed). Compliance with ARARs/TBCs in Attachments J.4.1 must be maintained during waste retrieval activities.

Secondary containment shall be provided for water systems used in waste retrieval. Treatment of the water collected from waste retrieval shall include, as a minimum, removal of suspended solids prior to discharging the water to the AWWT (Section C.5.1.1.3.2 describes the discharge criteria for water).

The Contractor shall meter and record the amount of dry Silo 3 material removed from the silo, by weight, prior to commingling the waste with any additives in accordance with Section G.2.2.

C.6.2.3 Mixing

Mixing includes processing, in advance of receipt of waste product by FDF, Silo 3 material and additives with mixers, pugmills, or other mechanical devices to create a homogenous stabilized/solidified waste product that will satisfy the Silo 3 WAC and material handling requirements of the Contractor's process. The mixing or blending cannot be performed for the purpose of diluting characteristically hazardous waste to render it noncharacteristically hazardous.

All ARARs (Attachments J.4.1 and J.4.2) shall be complied with, including those pertaining to dust control.

C.6.2.4 Stockpiling/Interim Storage

Stockpiling includes, but is not limited to, staging areas, storage tanks, containers, or bins used in the performance of the work. Stockpile volumes shall not exceed the limits determined necessary to maintain the DOE-approved Hazard Category per Section J.3.2.

Stockpiles or other storage areas designated during the course of the project shall be managed in accordance with the ARARs (Attachment J.4.1). No open piles, open storage, or conveyance systems for dispersible Silo 3 material shall be allowed (Section C.5.1.1.3.1). Specific substantive requirements include:

- Run-on/run-off control systems shall be designed and installed to preclude contact of stormwater with any waste;

- Collection and hold facilities associated with run-on/run-off control systems shall be emptied after storms. Capability for sampling potentially contaminated stormwater, including secondary containment systems (if applicable), shall be provided;

- Storage bins shall be designed to prevent wind dispersion;

- Storage areas shall be inspected weekly and after storms to ensure the integrity of containers and run-on/run-off controls;

- All stockpiled Silo 3 material shall be processed prior to any scheduled Mode 2 or Mode 3 shutdown as defined in Section C.6.2.15. In the event of an unscheduled shutdown, stockpiled material shall be protected from dispersion; and

- Containers of treated Silo 3 waste shall be managed in accordance with NESHAPS, Subpart Q, requirements for radon.

C.6.2.5 Segregation

Segregation includes, but is not limited to, any separation of a portion of the waste stream for specialized handling and/or processing (e.g., material segregated per the MSCC for shipment to the disposal facility and material segregated for reprocessing).

C.6.2.6 Access Control to Radiation/Contamination Areas

The Contractor shall control access to radiation areas and contamination areas in accordance with Section J.3.4.

The Contractor shall provide control points in accordance with Section J.3.4. The control points shall be large enough to accommodate an office area for two radiological control technicians, two telephones, three computers, dosimeter racks capable of holding badges for at least 1.5 times the peak work force, and storage space for PPE (e.g., anti-Cs and respirators) a minimum of 100 square feet of monitoring equipment storage space. Portable structures used for the control points shall be constructed in accordance with the requirements specified in Attachment J.4.53.

C.6.2.7 Size-Reduction

If size-reduction is needed to process oversized Silo 3 material or to reprocess failed waste, the Contractor shall ensure that airborne emissions be maintained below ten percent of the derived air concentration (DAC) in the work area and below two percent of the DAC at the project boundary as described in Section J.3.4.

C.6.2.8 Waste Transferring and Handling

All equipment and waste transfer and handling systems containing waste that is regulated as a hazardous waste under RCRA shall have secondary containment.

C.6.2.9 Waste Treatment

The stabilization treatment process shall convert untreated Silo 3 material into a stabilized

waste form that passes the TCLP test for RCRA-regulated metals and meets the Silo 3 WAC. Treatment operations begin with Silo 3 material entering from waste retrieval and end with verification of the acceptance of the stabilized product by the disposal facility.

Key elements of the Silo 3 WAC include:

- The waste must not exhibit a hazardous waste characteristic (or be a hazardous waste);
- The waste must contain less than 0.5 percent by volume of free liquids; and
- The waste must not contain particulates >1 percent by wt. less than 10 µm diameter, or >15 percent by wt. less than 200 µm diameter.

The Contractor shall develop a Process Control Plan (PCP) [Section C.5.1.4] to describe how the treatment process will deal with variability in the untreated material (refer to Section J.2.4). The data regarding Silo 3 material in Section J are provided as guidance to the Contractor. However, this information is not absolute and concentrations in the waste may vary from the data presented. The Contractor's PCP should address this potential variability. The PCP shall identify key control parameters and define a compositional envelope to accommodate fluctuations in the chemical composition and/or physical characteristics of the waste stream. Variability in laboratory and analytical data can be expected in:

- Chemistry;
- Particle size;
- Soluble constituents;
- Hazardous metals; and
- Radionuclides.

The treatment process shall be optimized and operated at all times within an acceptable range for the designated waste loading. Optimization will take into account the following parameters (at a minimum):

- Retention of RCRA metals in the product matrix (TCLP test);
- Maximum waste loading;
- Processing rate; and
- Container - waste form compatibility.

The treatment process shall be designed and operated to allow reprocessing of any product that fails to meet the Silo 3 WAC. To the extent practicable, the process must be amenable to treating secondary waste, including liquid effluents, expected to be generated during the project.

C.6.2.10 Waste Packaging for Transportation and Disposal

Silo 3 materials are classified as low-specific activity-II (LSA-II) material as defined by the DOT in 49 CFR Part 173.403. Specifically, Silo 3 materials are defined by DOT as "material in which the Class 7 (radioactive) material is essentially uniformly distributed and the average specific activity does not exceed 10^{-4} A_2/g" (A_2 is the maximum activity of the Silo 3 materials that could be placed in a Type A container if the wastes were not classified as LSA-II material).

C.6.2.10.1 Packaging and Storage Requirements

C.6.2.10.1.1 Treated Silo 3 Waste

The Contractor shall package treated Silo 3 waste in containers that meet the DOT performance criteria for an IP-2 container presented in 49 CFR Part 173.411(b)(2) and summarized in Table C.6-1. FDF may be present during the manufacturer's testing of the Contractor's shipping containers in accordance with DOT and disposal facility testing requirements, and FDF may perform periodic inspections of the Contractor's or subcontractor's container manufacturing and testing facilities. The Contractor shall submit quality assurance (QA) inspection records of the containers to FDF for approval prior to use of the containers.

Prior to use, the Contractor shall submit appropriate documentation, including assembly drawings and testing results, certifying that the requirements of Table C.6-1 have been satisfied. Containers to be used by the Contractor shall be approved by FDF. In addition, modifications to the container must be approved by FDF in advance of incorporation of modification into design. In addition, the Contractor shall consult with FDF personnel regarding the need for retesting of modified containers. If FDF determines retesting is necessary, the Contractor shall have the appropriate tests performed and provide the aappropriate documentation, including assembly drawings, testing results, and QA inspection records, to FDF for approval prior to use of the containers.

C.6.2.10.1.2

The Contractor shall maintain an adequate inventory of containers to meet the needs of the processing rate of the treatment facility and prevent any work stoppages.

C.6.2.10.1.3

The Contractor shall ensure the amount of treated waste placed in each container does not exceed the container's rated payload capacity and freeboard requirements.

C.6.2.10.1.4

The Contractor shall verify the payload capacity of the container has not been exceeded. Each container over the rated payload capacity shall be returned to the Contractor for

repackaging.

C.6.2.10.1.5

The Contractor shall ensure enough space is available for interim staging of filled containers prior to transfer to FDF for shipment to the disposal facility. The interim staging capacity shall account for appropriate activities required prior to shipment, including but not limited to, the Contractor's time for waste curing and analysis of treated waste, and FDF's time to verify compliance with the Silo 3 WAC.

Upon receipt of the data package from the Contractor, FDF will require a maximum of 45 calendar days to perform all activities necessary to validate Contractor data packages prior to removing waste from the interim staging area for shipment to the off-site disposal facility. FDF activities will include, but not be limited to, validate data packages for Silo 3 WAC attainment, complete material evaluation form (MEF), complete 65-card, complete SWIFTS data base entry, load and prepare shipments.

Upon verification that Silo 3 material has been treated and packaged to meet the Silo 3 WAC, FDF will assume ownership of the treated waste.

C.6.2.10.1.6

Management of the containers and interim staging area shall be the responsibility of the Contractor using the FDF labor force. Damage to containers placed in the Contractor's interim staging area prior to transfer to FDF shall be the responsibility of the Contractor. Movement of filled containers to the interim staging area shall be performed by the Contractor using the FDF labor force, as well as replacement of filled containers with empty containers.

C.6.2.10.1.7 Secondary Waste

Classification and packaging of secondary wastes generated by the Contractor shall be based on radiological monitoring data provided by FDF and analytical data and process information provided by the Contractor to FDF personnel. All waste streams and waste containers shall possess corresponding MEFs, 65-cards, lot codes, and inventory numbers for proper tracking in FDF's SWIFTS database.

Secondary waste generated during operations, that is destined for off-site disposal, shall be packaged in containers appropriate for the materials' DOT hazard classification as defined in 49 CFR, Subchapter C, Hazardous Materials Regulations and the Silo 3 WAC. Containers shall be approved by FDF.

Table C.6-1 Performance Basis for IP-2 Type Container

Item	Description	References
PR-001	The IP-2 Container shall be easily handled and properly secured during transport.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-002	Each lifting attachment that is a structural part of the IP-2 Container shall be designed with a minimum safety factor of three against yielding when used to lift the package in the intended manner.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-003	The external surface of the IP-2 Container, as far as practicable, shall be free of protruding features and shall be easily decontaminated.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-004	The outer layer of the IP-2 Container, as far as practicable, shall avoid pockets or crevices where water might collect.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-005	Any feature added to the IP-2 Container shall not reduce its safety.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-006	Materials of construction of the IP-2 Container shall be physically and chemically compatible with the contents of the package.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-007	The IP-2 Container shall be capable of withstanding effects of any acceleration, vibration, or vibration resonance that may arise under normal conditions of transport without any deterioration in the effectiveness of the closing devices on the receptacle or in the integrity of the package as a whole and without loosening or unintentionally releasing the nuts, bolts, or other securing devices.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-008	All valves through which the contents of the IP-2 Container could escape shall be protected against unauthorized operation.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-009	When subjected to the free drop test (49 CFR Part 173.465(c)) and stacking test (49 CFR Part 173.465(d)), the IP-2 Container must prevent loss of or dispersal of radioactive contents, and greater than a 20% increase in radiation levels recorded or calculated at the external surfaces for the conditions before the test.	Section C.6.2.10, 49 CFR Part 173.411(b)(2)
PR-010	Disposal Container closure shall be sturdy enough so as to not be breached during normal handling conditions	Silo 3 WAC Design Requirements, Attachment J.4.4
PR-011	Disposal Container shall be secured to prevent unauthorized intrusion.	Silo 3 WAC Design Requirements, Attachment J.4.4
PR-012	Disposal Container shall be capable of supporting a uniformly distributed load of 16,477 kg/m^2 (3,375 lbs/ft^2).	Silo 3 WAC Design Requirements, Attachment J.4.4
PR-013	Disposal Container shall be provided with cleats, offsets, rings, handles, permanently attached or removable skids, other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting devices designed to a 5:1 safety factor based on ultimate strength of material. Rigging devices not permanently attached shall have a current load test based on 125 percent of the safe working load.	Silo 3 WAC Design Requirements, Attachment J.4.4
PR-014	Disposal Container shall be designed to the following dimensions 1.2 m width x 1.2 m height x 2.1 m length (4 ft x 4 ft x 7 ft) or 1.2 m width x 0.6 m height x 2.1 m length (4 ft x 2 ft x 7 ft) for boxes, or 208 liter (55 gallon) for drums. Other proposed dimensions must be approved by FDF.	Silo 3 WAC Design Requirements, Attachment J.4.4
PR-015	Disposal Container shall provide necessary shielding to maintain external surface radiation levels below 200 mrem/hr.	Silo 3 WAC Design Requirements, Attachment J.4.4
PR-016	Disposal Container shall not exceed a gross weight of 4,082 kg (9,000 lbs) per box or 544 kg (1,200 lbs) per drum.	Silo 3 WAC Design Requirements, Attachment J.4.4
PR-017	Disposal Container shall be able to withstand routine forces of handling and stacking incurred during storage, loading, and staging operations.	General Requirements
PR-018	Disposal container shall possess features to enable handling by a forklift vehicle. Forklift interface shall accomodate fork tines that are 48" apart 12" wide by 4" thick.	General Requirements

C.6.2.10.2 Packaging Requirements for Transportation

C.6.2.10.2.1

Treated Silo 3 waste shall be packaged for shipment as LSA-II solid material under exclusive use conditions in accordance with 49 CFR Part 173.427. The Contractor shall ensure that the containers selected for shipment of treated Silo 3 waste meet external radiation level limitations for exclusive use conditions under 49 CFR Part 173.441(b). These radiation level limits are as follows:

- 200 mrem/h on the external surface of the package;
- 200 mrem/h on any point on the external surface of the vehicle, including the top and underside of the vehicle;
- 10 mrem/h at any point two meters from the vehicle, excluding the top and underside of the vehicle; and
- 2 mrem/h in any normally occupied space.

C.6.2.10.2.2

The Contractor shall coordinate efforts with FDF for preparing full containers for transport. This includes surveying the external surface of containers and cleaning, as necessary, the external surface of the container so the level of nonfixed contamination on the external surface of the container does not exceed 10^{-5} µCi/cm^2 for beta, gamma, and low-toxicity alpha-emitters and 10^{-6} µCi/cm^2 for all other alpha-emitting radionuclides.

Prior to closing and sealing containers, the Contractor shall add an absorbent that is compatible with the waste to minimize the formation of free liquids. The Contractor shall be responsible to close and seal the container so nonfixed contamination does not exceed ten times these levels at any point during transportation. FDF will observe waste packaging operations including closing, sealing, and surveying of containers.

C.6.2.10.2.3

The Contractor shall provide FDF personnel with the necessary documentation to ensure that containers are properly marked and labeled, and the proper placards and shipping papers are provided to the carrier. FDF personnel shall mark and label the containers, and provide the proper placards and shipping papers to the carrier.

C.6.2.10.2.4

All shipping papers and all documentation necessary to track waste through the FEMP tracking system will be prepared and signed by FDF personnel.

C.6.2.10.3 Disposal Requirements

C.6.2.10.3.1

The Contractor shall treat Silo 3 material to meet the Silo 3 WAC. This will include treatment of the material to immobilize the RCRA-regulated metal constituents and eliminate the toxicity characteristic associated with the material and treatment to immobilize fine particulates and remove any free liquids. Disposal of Silo 3 material will be performed by FDF and is not included in the scope of this contract.

C.6.2.10.3.2

Containers used for packaging stabilized treated Silo 3 wastes must meet the waste package criteria of the Silo 3 WAC. This criteria includes design, nuclear safety, radiation levels, external contamination, activity limits, nuclear heating, and multiple hazards requirements in 49 CFR, 40 CFR, 10 CFR, and DOE Orders.

The disposal package shall support a uniformly distributed load of 16,477 kg/m^2 (3,375 lbs/ft^2).

The Contractor shall use either 1.2 m x 1.2 m x 2.1 m (4' x 4' x 7') or 1.2 m x 0.6 m x 2.1 m (4' x 2' x 7') boxes or 208 liter (55 gallon) drums, with weight limitations of 4,082 kg (9,000 lb) per box and 544 kg (1,200 lb) per drum. Other proposed dimensions must be approved by FDF.

The Contractor shall refer to Attachment J.4.4 for a detailed discussion of the Silo 3 WAC and the waste package criteria.

C.6.2.10.3.3

The Contractor shall provide FDF personnel with the necessary documentation (e.g. laboratory and analytical data) to properly and accurately evaluate the treated Silo 3 waste against the Silo 3 WAC. The Contractor shall coordinate efforts with FDF personnel for preparing the waste stream application for treated Silo 3 waste and obtaining acceptance of treated Silo 3 waste.

C.6.2.10.3.4

Treated Silo 3 waste, failing to meet the Silo 3 WAC shall be reprocessed by the Contractor. In addition, containers that are rejected at the disposal facility, either because the container or the treated waste does not meet the disposal facility requirements, may be shipped back to the FEMP to the Contractor for reprocessing. At FDF's sole discretion, containers so rejected may undergo corrective action at the disposal facility and the Contractor charged for the corrective actions.

C.6.2.10.3.5

Generation of secondary waste must be kept to a minimum and, to the extent practical, should be recycled during the treatment process. Management of secondary waste generated by the Contractor shall be the responsibility of the Contractor. All wastes must be managed in accordance with the project ARARs, applicable DOE Orders, and site procedures, as prescribed in the Contractor's waste management plan, integral to the project Environmental Control Plan.

Classification and packaging of secondary wastes (including dismantling and cleanup wastes) generated by the Contractor shall include radiological monitoring provided by FDF and analytical data and process information provided by the Contractor. The Contractor is encouraged to recycle radioactive secondary wastes back into the process wastes for treatment for proper disposal with stabilized Silo 3 waste. Records of secondary waste generated (and recycled) must be managed by the Contractor and provided to FDF upon request. Disposal of secondary waste will be the responsibility of FDF.

C.6.2.10.3.6

As part of its Environmental Control Plan, the Contractor shall develop a waste management plan, detailing the identification and management of secondary waste streams (i.e., wastewater, PPE, HEPA filters, excess hazardous materials brought on-site for process raw materials) (Section C.6.2.13.5) including procedures for handling, treating, and packaging the waste. Treatment and packaging of secondary waste shall be in accordance with project ARARs. Dilution, as a substitute for treatment, shall not be allowed.

C.6.2.11 Contingency Planning and Emergency Response

Contingency Planning and Emergency Response will be shared by both FDF and the Contractor. FEMP's Emergency Plan will be used by the FDF Emergency Response Team (ERT) in response to any emergency situation in the project area including, but not limited to fire, personnel injury, or spills. The Contractor shall inform the FDF Facility Owner in the event of an emergency. The Facility Owner will contact the FDF AEDO. The Contractor shall also prepare a specific Contingency Plan for the project. The requirements for the Contingency Plan are contained in DOE Orders 151.1, Comprehensive Emergency Management System and shall address ARARs in Table J.4.1-3 of Attachment J.4.1.

The Contractor shall review the FEMP's Emergency Plan and prepare a Contingency Plan for the scope of work to be performed. The Contingency Plan shall be incorporated into the RD Package (Section C.5.1.4). This Contingency Plan shall complement, interface with, and reference, as appropriate, the FEMP Emergency Plan. In addition, the Contractor shall provide assistance to FDF for revising the Silos Emergency Recovery Plan, as necessary.

FDF maintains the necessary emergency plans and procedures to adequately address emergency situations. During off-normal events, FDF will take over the Contractor's work area and implement appropriate actions, with direct input from the Contractor, as directed

by the Emergency Duty Officer (EDO) or Assistant Emergency Duty Officer (AEDO) and the ERT. The FDF AEDO will also be notified of unplanned nonlife-threatening events, such as a pipe or valve leak. The specific requirements for notification of the EDO or AEDO are discussed further in Section J.3.4.

C.6.2.12 Maintenance

The Contractor using assigned FDF maintenance personnel shall maintain systems and equipment on a routine basis. The Contractor shall provide the necessary equipment and facilities for performing maintenance activities. Before commencing operations, maintenance activities shall be defined with specific schedules, procedures, specifications, and plans, and incorporated into the Maintenance Plan (Section C.6.3.2). The Maintenance Plan shall be in compliance with DOE Order 4330.4B unless otherwise specified by FDF. FDF will approve the Contractor's Maintenance Plan. As a minimum, maintenance schedules shall conform to equipment manufacturer's recommendations. In coordination with FDF, emergency maintenance activities shall be corrected as soon as possible. The Contractor shall inspect systems carrying waste on a regular basis to verify the continued integrity of equipment.

The Contractor shall develop a Maintenance Plan that defines the day-to-day work required to sustain property in a condition suitable for its designated purpose and includes preventative and corrective maintenance and modifications. The plan shall include at a minimum:

- Equipment Numbering - All structures, systems, and components (SSC) installed to support aspects of the Silo 3 Project shall be numbered in accordance with the numbering system used in the site maintenance computer data base. The Contractor shall coordinate the numbering of equipment with the FDF Technical Representative. The FDF Technical Representative shall be notified of all equipment numbers so that the SSC can properly be entered into the data base.

- Equipment Technical Documents - The FDF Technical Representative shall be provided with two copies of all operator manuals, maintenance manuals, repair parts manuals, technical bulletins, safety bulletins, calibration tables, or other technical documents applicable to all SSC installed.

- Pipe Labeling - In order to provide for the safety of personnel, any piping systems installed shall be labeled in accordance with FDF Procedure ED-12-4016 (Attachment J.4.39).

- Electrical Labeling - To ensure the safety of personnel, all disconnect switches, circuit breaker load centers and other circuit control devices installed shall be labeled with sequential numbers and labeled with voltages in accordance with the National Electrical Code and FDF Procedure ED-12-4016 (Attachment J.4.39).

- Preventive Maintenance Work Plans - For all SSC installed, the Contractor shall ensure

that preventive maintenance work plans are prepared by subject matter experts. Copies of the work plans shall be provided to the FDF Technical Representative so that they can properly be entered into the maintenance data base. A Blanket Work Order will be prepared by FDF under which FAT&LC workforce can work.

! Equipment Specific Energy Isolation Plans - In order to provide for the safety of FDF personnel who may respond to the Contractor's work site, the Contractor shall ensure that Equipment Specific Energy Isolation Plans, consistent with the provisions of 29 CFR Part 1910.147 and the FDF Lockout/Tagout Procedure (Attachment J.4.76), are prepared and filed with the FDF Safety Organization and shall ensure that the plans are kept current throughout the life cycle of all SSC installed to support aspects of the Silo 3 Project.

! P&ID - In order to support maintainability studies, the Contractor shall provide the FDF Maintenance Organization with copies of P&IDs for piping and instruments and copies of all changes which might be made to the P&IDs.

! Daily Inspections - The Contractor shall perform and document daily inspections of all equipment for signs of leakage or deterioration and shall also document all maintenance activities of its facilities and equipment, including replacement of parts and equipment.

! Calibration Records - The Contractor shall maintain on-site calibration records on all its equipment and instruments requiring calibration, including monitoring equipment, health and safety equipment, measuring equipment, scales, etc.

! Equipment Repair History - The Contractor shall maintain a history of repair work performed on all equipment, including treatment process equipment, monitoring equipment, and health and safety equipment.

! Control and Calibration of Measuring and Test Equipment - The Contractor shall provide copies of certification and calibration records for any equipment used for measuring, weighing, calibrating, and testing equipment to FDF prior to conducting activities.

! Master Equipment List - The Contractor shall maintain a master list of all equipment used by the Contractor on work performed under this contract. The equipment list shall include make, model, manufacturer and equipment number and a cross-reference with the spare parts list.

! Training Requirements - The Contractor shall provide maintenance training to the Contractor's and FAT&LC personnel. FDF will provide the facilities and recordkeeping for this training. An FDF training instructor will also be provided to assist the Contractor in conducting operations training.

! Document Control - The Contractor shall maintain control of all documents associated with maintenance activities in accordance with the requirements specified in Attachment

J.4.48. This includes calibration records on monitoring and health and safety equipment.

- Rigging shall be done in compliance with the DOE Hoisting and Rigging Manual (All Chapters except Chapter 15 which is construction).

- Material Receipt Inspection; and

- Spare Parts - The Contractor shall maintain essential spare parts in stock to minimize shutdown time for maintenance on operating equipment.

Maintenance activities will be reviewed at a minimum by FDF Engineering, Safety, and Quality Assurance, who will sign and date indicating approval of the planned maintenance activity.

C.6.2.13 Environmental Controls

An Environmental Control Plan for Operations shall be required for submittal and approval as part of the OWP. The plan shall address control and management of emissions via air, wastewater and stormwater, and solid (secondary) waste.

All aspects of the remediation of Silo 3 material, including waste retrieval, staging and storage, processing/treatment, waste management, and transportation shall be operated and maintained in a manner that incorporates environmental ALARA to minimize the potential for release to the environment of any contaminants. The site procedure and checklist for evaluation of environmental ALARA is included in Attachment J.4.74. Contaminant pathways include air, water, and solid waste management. Design and/or selection of process technology, control equipment, additives, etc. used in the process shall be based on a philosophy of minimization of volume and toxicity of waste, as well as other effluents released to the environment.

C.6.2.13.1 Air Emissions Control

A large fraction of the Silo 3 material may consist of fine particulate material in the sub-micron size range. Therefore, waste retrieval and preparation of the Silo 3 material for treatment shall be done using enclosed systems, which control release of radionuclides and other particulate matter to the environment. Treatment operations shall control the release of air contaminants from the process. Any point source or off-gas system used in remediation shall be capable of reducing the air contaminant concentrations to below the regulatory limits established by the ARARs and TBCs for the project (Attachment J.4.1). Compliance with the emission limits will be determined by FDF using FEMP sitewide air models, the Contractor's air emissions data supplied in accordance with Section C.5.1.3.4, and confirmatory sampling. Refer to Section J.2 and Attachments J.4.30 and J.4.44 for more information on the physical characteristics of the Silo 3 material, and to Section C.5.1.1.3.1 for additional information on requirements for air emissions.

Dust suppression activities shall not increase the contamination in the area where the dust suppressant is being applied. Clean water (e.g., precipitation collected from roof drains) may be used as a dust suppressant in areas that are not in direct contact with the waste. Other suppressants may be used to control dust if they are previously approved by FDF (Section C.5.2.1.8 includes more specific information on dust control).

C.6.2.13.2 Wastewater Controls and Integration

The Contractor's treatment process shall be designed to minimize the generation of wastewater, or recycle wastewater produced during the treatment process in order to minimize the amount of wastewater that must be treated by the FEMP AWWT system. Wastewater generated by the treatment process (and contaminated stormwater) shall be pretreated by the Contractor, if necessary, to ensure compliance with the FEMP NPDES permit for the AWWT system (Attachment J.4.58). Confirmatory sampling shall be conducted on wastewater (and contaminated stormwater) prior to release to the AWWT for final treatment prior to discharge to receiving waters. Refer to Sections C.5.1.1.3.2 and C.6.2.14.3 for specific requirements and additional information on management of wastewater.

C.6.2.13.3 Stormwater Controls and Integration

The Contractor shall maintain any portion of an existing stormwater management system within the Contractor's work area, in accordance with the approved RD Package (Section C.5.1.4). The Contractor shall integrate the use, operation, management, maintenance, and control of these existing systems into the design, operation, and maintenance of the Contractor's facility. Refer to Sections C.5.1.1.3.2 and C.6.2.14.3 for specific requirements and additional information on stormwater management.

C.6.2.13.4 Erosion and Sediment Control

Appropriate measures shall be implemented by the Contractor to prevent erosion and control sediment during operations. Erosion and siltation controls shall be maintained during operation until the need for such controls is removed following demobilization. In addition to design and operation of controls to meet the ODOT standards, Rainwater and Land Development: Ohio's Standards for Stormwater Management, Land Development and Urban Stream Protection, Second Edition, ODNR Division of Soil and Water Conservation, Columbus, Ohio, 1996 [Formerly U.S. Department of Agriculture-Soil Conservation Service, Water Management and Sediment Control in Urbanizing Areas, U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C., 1987] shall be used as a guideline for establishing erosion and sediment control (Section C.5.2.1.7).

C.6.2.13.5 Secondary Waste Management

A plan for management of secondary waste generated during remediation operations shall be included in the Environmental Control Plan for Operations (Section C.5.1.4). Design and

operation of the remediation process shall be done in a manner that minimizes secondary waste generation. Waste management shall be based on a philosophy of waste minimization, recycling, and environmental ALARA. The methods used to manage waste and debris generated during operations shall be consistent with the ARARs and TBCs included in Attachment J.4.1 and site procedures. Secondary waste management includes waste characterization, staging, segregation and containment, and disposal. Also refer to Section C.5.1.1.3.3 (for construction waste) and Section C.6.2.10 (for packaging, transportation, disposal, and FDF interface requirements).

C.6.2.14 Sampling and Analysis

This section provides the sampling and analysis requirements for the remediated waste to meet the Silo 3 WAC (Attachment J.4.4), for process wastewater and contaminated stormwater to meet AWWT acceptance requirements (Section C.5.1.1.3.2), and for point source air emissions to meet environmental regulatory requirements (Section C.5.1.1.3.1).

The Contractor shall maintain a quality sampling and analysis program which produces defensible data in accordance with applicable federal, state, and local regulations. All activities and documents related to sample collection, analysis, data management, quality control, and preparation of required regulatory reports for submittal to FDF shall be the responsibility of the Contractor.

The laboratory chosen by the Contractor to perform analysis will be reviewed and approved by FDF. A list of FDF-certified laboratories is found in Attachment J.4.77.

The Contractor shall prepare a Sampling and Analysis Plan (SAP), as part of the Operations Work Plan, to meet U.S. EPA approval, and the Silo 3 WAC. The plan shall be submitted to FDF for review and approval by FDF, DOE, and the U.S. EPA. The plan shall include the following:

- Sampling points;
- Frequency of sampling;
- Laboratory and analytical services;
- Sample custody and control;
- Laboratory selections, control, and management;
- Payment of laboratory fees;
- Laboratory data management;
- Turnaround times and sample flow;
- NRC license verification;
- Selection of analytical protocol to meet WAC;
- Sample shipment;
- Laboratory waste management;
- Laboratory quality control;
- Evaluation/analysis of laboratory data; and
- Schedule and/or frequency of submittal of environmental monitoring data to FDF; and
- Preparation of regulatory reports for submittal to FDF.

Quality control and quality assurance for sampling and analysis are addressed in Section C.6.2.14.6.2.

At any time, the disposal facility, FDF, and/or the EPAs may collect or request the Contractor to provide samples of the waste for independent analysis. FDF and/or the EPAs may also, at any time, collect samples for analysis to independently verify compliance with waste and wastewater treatment and discharge requirements, air emissions limits, other terms of this contract, and any pertinent regulatory criteria.

Prior to starting field activities, the SAP for remediated waste shall be approved by the EPAs, FDF, DOE, and the disposal facility. FDF will coordinate review and approval of the SAP with the disposal facility during its review period.

Prior to the start of operations, FDF, DOE, and the EPAs must approve the SAP for evaluation of point source air emissions, wastewater and stormwater discharged from the process area, and remediated waste scheduled for off-site disposal. Analytical data generated pursuant to certification of FEMP wastes for off-site disposal shall meet the requirements of the Silo 3 WAC.

C.6.2.14.1 Summary of Sampling and Analysis Activities

Waste and byproducts of the waste processing system shall be sampled and analyzed prior to disposal or discharge to certify compliance with the various discharge criteria contained herein. These waste streams include, but are not limited to, both untreated and treated Silo 3 materials, contaminated process wastewater and stormwater, and air emissions.

Process control sampling and analysis activities shall be performed on both primary and support systems. The process control sampling and analysis program shall have three primary components: sampling, analysis, and response parameters. The sampling component shall include guidance on sampling documentation, frequency, requirements, and custody protocol. The analytical component shall include analytical methods, detection limits, and necessary turnaround times. The response parameters component will include process control operating parameters, which indicate proper operation of the treatment system. Response action levels shall be established and the necessary corrective actions taken to ensure that the proper operation of the treatment system is maintained.

C.6.2.14.2 Waste Sampling

After the Silo 3 material has been processed, samples of the waste shall be taken by the Contractor to allow FDF to develop material evaluation forms (MEFs) for tracking the waste stream and to certify that the waste meets the Silo 3 WAC. The frequency of sampling shall be identified in the Contractor's SAP. The frequency of sampling shall be based on the treatment technology selected by the Contractor, as well as the analytical data needs of the disposal facility for acceptance of the treated waste. Considered in the determination for frequency of sampling shall be the processing method selected by the Contractor (i.e., continuous versus batch processing), the container, population size, and process control data.

More frequent sampling shall be required for treatment systems that do not operate within established process control limits to allow for FDF to either develop new or modify existing MEFs and to certify that the waste meets the Silo 3 WAC. In addition, the analytical parameter list shall be based on the analytical data needs for the Silo 3 WAC. Analytical parameters that may be required for the Silo 3 WAC may include, but are not limited to the following:

! Radiochemical Analysis

- Isotopic analysis (constituents of concern); and
- Gamma scan.

! Chemical Analysis

- TCLP metals (8);
- Paint filter liquid test;
- pH;
- Sulfide released; and
- Cyanide released.

C.6.2.14.3 Water Sampling

Process wastewater, and run-off water from contaminated areas shall be staged and sampled prior to discharge from the Contractor's work area to certify that the water is acceptable for release to the AWWT. The Contractor shall conduct any sampling and analysis necessary to ensure compliance with the requirements in Section C.5.1.1.3.2.

C.6.2.14.4 Air Monitoring and Sampling

Air emissions from operations, including waste retrieval and processing, may contain a variety of radioactive and inorganic particulates, as well as radon. The Contractor shall design and control operations to minimize the release of all contaminants to air. The approach to design and control for air emissions is outlined in Section C.5.1.1.3.1.

In addition to use of BAT to control contaminants to meet the substantive requirements of the OEPA PTI, sampling and analysis of the treatment system off-gas, process ventilation system off-gas, and/or emissions from any other point source for the constituents expected to be emitted from the process, may be required. The decision whether sampling and/or monitoring shall be required depends on the process design, and types and amounts of constituents expected to be released in comparison to emission limits imposed by the regulations. This monitoring is most likely to be required for radon and radionuclides emitted as a point source from a stack.

Radon

Whether continuous monitoring for radon is required depends on the design and remedial process, as well as estimates of radon released from the point source submitted by the

Contractor. Radon emissions from any point source shall be controlled in a manner that shall not cause the point source to result in a contribution to the fenceline radon concentration of greater than 0.5 pCi/L, as an annual average above background. If estimates of radon released from the point source (without control) could cause this limit to be exceeded, or are within an order of magnitude of the source term (for air modeling) that would cause an exceedence of this limit, then continuous radon monitoring shall be required. Additional information on radon requirements for the project is included in Section C.5.1.1.3.1.

Radionuclides

The Contractor shall recycle ventilation air and off-gas to the extent practicable in order to minimize releases to the atmosphere. Monitoring of a point source for radionuclide particulate to comply with the U.S. EPA NESHAP, 40 CFR Part 61 Subpart H, ARAR depends on the expected public dose from the released radionuclides (other than radon), based on sitewide dispersion modeling using source term release estimates submitted by the Contractor. According to 40 CFR Part 61.92, emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive, in any year, an EDE of ten mrem/year. Continuous monitoring of radionuclide emissions from the point source shall be required if the expected dose to the public exceeds 0.1 mrem/year. If air emissions of radionuclides are anticipated, the Contractor shall estimate whether continuous stack monitoring would be required by using the methods outlined in 40 CFR Part 61 Subpart H to evaluate preliminary process design information (Section C.5.1.2.3) by comparing expected off-site dose to the U.S. EPA standard of 0.1 mrem/year. The evaluation must use an approved U.S. EPA dispersion model, local meteorologic data, and be based on expected emissions prior to installation of any air pollution control devices. The closest off-site receptor is 550 meters in a SSW direction from Silo 3. Based on the Contractor's emissions data (Section C.5.1.3.4) submitted with the proposal, FDF will confirm compliance with this standard, and whether continuous monitoring is required, as well as determine whether the site limit of ten mrem/year is maintained by the Contractor's proposed design and operation. Refer to Section C.5.1.1.3.1 for more information on compliance with the NESHAP Subpart H standard.

If continuous monitoring by isokinetic sampler for radioactive particulate is required for any point source ventilation air or off-gas discharges to the atmosphere, the Contractor shall provide equipment and perform stack monitoring using continuous isokinetic sampling in accordance with the requirements of 40 CFR Part 61.92, NESHAP Subpart H. The Contractor shall locate and install the stack monitoring system in accordance with Methods 1 and 2 as required under 40 CFR Part 60 as referenced under Subpart H. Subpart H also references ANSI N13.1-1969, which should be used as guidance for sampling the exhaust stack. The Contractor shall design and operate the stack monitoring system.

A continuous isokinetic sampler shall perform the following functions:

- Withdraw a continuous representative sample of off-gas from the stack at the same velocity as the stack off-gas velocity. The sample would be passed through a filter to collect particulate material. Based on the Contractor's predicted off-gas emissions, FDF

will use an integrated site model to determine which radionuclides shall be measured in the sample and how often the sample paper shall be replaced. All radionuclides that contribute greater than ten percent of the potential EDE for the stack shall be measured. The Contractor shall collect and analyze the sample paper in accordance with 40 CFR Part 61, Appendix B, Method 114;

- Continuously monitor the stack filter paper for beta/gamma radiation to detect any acute release of radioactive materials going out the stack. The counter must initiate an alarm if activity levels from the radionuclides of concern exceed background levels greater than the desired set point. The Contractor shall provide the technical basis for its selection of alarm set point. The purpose of the counter/alarm is to detect when the HEPA filter has failed, resulting in a release of radionuclides out the stack. Feed to the treatment system shall be discontinued if an alarm occurs. The failed HEPA filter shall be replaced and any operational problems corrected, or a false alarm verified;

- Measure the stack flow rate and sample flow rate; compare the two flow rates; and adjust the sample flow rate, if needed, to ensure continuous isokinetic sampling. Total the stack and sample air flow during operation so the total volume of gas emitted out the stack can be obtained and the total amount of emissions can be calculated;

- The sampling system shall be designed to prevent false alarms due to potential rapid buildup of radon daughter products on the filter paper. Particulate radon decay daughters formed downstream of the HEPA filters may be captured by the collection filter. If this occurs, the stack monitor may false alarm. The Contractor shall propose a solution to this potential problem;

- A data-logging system shall display and record the following data for the stack monitoring system as part of the project record: stack flow rate; radiation count on the filter paper; status of the exhaust fan and sampling pump; total stack flow; and total sample flow. Also, the data logging system shall display and record the following alarms: low stack flow, low sample flow, nonisokinetic, and high radiation;

- The sampling pump for the stack monitoring system shall be interlocked with the exhaust fan, so the stack monitoring system shall be in operation whenever the exhaust is operating. The vacuum pump shall not require oil, and shall be attached to an operating vacuum gauge;

- A back-up power supply shall be provided so the stack monitoring system can operate during a power outage until the treatment system has been secured in a safe manner and emissions have been reduced to zero;

- The isokinetic sampler shall be protected from excessive water vapor in the off-gas which could damage the sampler or cause erroneous analytical results. The sample holder, associated tubing, rotameter, and sample vacuum pump must be able to withstand the weather if located outdoors. Bends, excessive curvature, and length of sample tubing shall be minimized with no horizontal sections and shall be stainless steel. Flexible tubing shall

be used below the sample holder for easy access to the sample filter. All electronics and instruments shall be located indoors or in a weather-proof enclosure; and

- A platform with handrails shall be constructed to gain access to the stack monitoring system for changing filters or maintenance. The platform shall be at least 4' by 4' with an access ladder or steps.

BAT Performance Verification

Pending review by the OEPA, other point source emissions of air contaminants may be required to be monitored to ensure that the process and controls are in compliance with all ARARs (Attachment J.4.1).

If required, an independent performance test firm will be retained by FDF to perform emissions testing on the exhaust stack to verify that the BAT is controlling emissions from the stack. The Contractor shall conduct the exhaust stack performance test in accordance with 40 CFR Part 60, Appendix A and 40 CFR Part 61, Appendix B, Method 114. The scope of work and performance test criteria will be developed by FDF based on the air emissions, and submitted to the OEPA for approval, if required. The performance test data may also be submitted to OEPA, if required.

FDF will perform environmental ambient air monitoring outside the process area.

C.6.2.14.5 Secondary Waste Sampling

Although not specifically identified in the SAP, secondary waste streams will likely be generated during the life of the project. These wastes shall be characterized in accordance with the ARARs identified in Attachment J.4.1, specifically the RCRA waste characterization requirements under 40 CFR Part 262.11.

C.6.2.14.6 Technical Requirements

The Contractor shall use, to the maximum practical extent, real-time monitoring for emissions. Samples shall be representative of the waste stream. Analytical methods, analyses, and quality control systems shall produce defensible data. Analysts shall be experienced and qualified to perform the analytical methods. Laboratory services used by the Contractor shall be licensed to handle radioactive materials and shall show competency in the analyses they perform. Data shall be presented in a format specified by FDF and the disposal facility. FDF will provide oversight of sampling and analysis activities and shall require the Contractor to provide samples for independent analysis.

The Contractor shall submit complete laboratory data packages within 30 days of sampling to FDF for approval prior to FDF acceptance of waste containers for shipment to the disposal facility.

C.6.2.14.6.1 Analytical Requirements

Analytical methods used shall be in accordance with the state certification requirements acceptable to U.S. EPA, FDF and the disposal facility.

C.6.2.14.6.2 Sampling and Analysis Quality Control

The Contractor's laboratory shall submit a quality control program for analytical, radiochemical, physical testing, and screening analysis in accordance with the certification requirements for the disposal facility, and the data quality objective requirements of Sections 9 and 12, and Appendices E and G of the SCQ (Attachment J.4.33) for both the Silo 3 WAC and process control testing. Laboratory control manuals from the Contractor's laboratories and contracted laboratories shall be available for FDF or the disposal facility upon request.

C.6.2.14.6.3 Laboratory Data Management

All laboratory data becomes the property of DOE at the completion of the project. A data management system shall be in place to track generated analytical data. The system shall be accessible to DOE and/or FDF throughout the project, in an electronic format that allows downloading of analytical data. All laboratory data shall be submitted to FDF prior to the end of the project.

C.6.2.14.6.4 Laboratory Waste Management

The Contractor shall recycle certain sample material such as used, altered, and unaltered process control or waste characterization samples back into the treatment process.

Waste generated during the analysis of samples that cannot be recycled through the treatment process shall be managed, containerized, and stored by the Contractor in compliance with DOE Orders (i.e., 5820.24), site procedures, U.S. EPA regulations, DOT regulations, and other applicable state and federal laws. Waste shall be properly segregated and containerized. Incompatible wastes shall not be placed in the same container and shall be stored separately from each other.

Laboratory samples shall be discarded into approved Contractor-supplied drums fitted with liquid-tight lids. Inventories of the contents of the drums shall be documented in accordance with the chain-of-custody requirements specified in Attachment J.4.33. The Contractor shall properly store, manage, control, inspect, and dispose of the waste.

C.6.2.14.6.5 Portable Analytical Laboratory Facilities

The Contractor may provide a portable Analytical Laboratory Facility to meet requirements identified in Section C.6.2.14. Portable analytical laboratory facilities and their personnel shall be subject to audits in accordance with the FEMP SCQ and any necessary certifications required by the Silo 3 WAC. Portable analytical laboratory facilities shall be constructed in accordance with the requirements for portable structures in Attachment J.4.53. Equipment used for analysis shall meet the requirements specified in

Section C.6.2.14. Background radiation levels that can be tolerated by the analytical equipment to maintain accuracy shall be provided to FDF so that FDF can locate a suitable location for the laboratory (if required).

C.6.2.15 Shutdown

Shutdown of the operations shall be defined by three modes, depending on the reason for and the length of the shutdown and the required elements of the shutdown.

C.6.2.15.1 Shutdown Mode 1: Immediate Shutdown

In the event of a catastrophic system failure or threat to human health, safety, or the environment, the shutdown of operations shall be abrupt and immediate. All systems and operations shall be stopped and placed in a safe configuration and no equipment decontamination shall be required. This mode can be initiated by any project personnel in the event of threat to worker safety, public health, and/or the environment. Operations will remain shutdown until the cause is identified, corrective action completed, and a mutual restart date is agreed upon by the Contractor, FDF, and if necessary, DOE, and the EPAs.

C.6.2.15.2 Shutdown Mode 2: Short-Term Shutdown

A short-term shutdown would occur to repair or replace failed equipment, perform scheduled system maintenance, resolve technical problems, or wait for materials. Maintenance performed outside of normal first-shift operating hours will not be considered a shutdown. Maintenance during the normal work day will not be considered a shutdown or a standdown, unless eleven consecutive work days pass without waste processing activity. This mode shall be initiated by the Contractor in coordination with FDF. A determination will be made by FDF, based upon the nature, extent, and duration of the shutdown, as to the requirements for restart of the operations under DOE Order 425.1 (Section C.5.5, Pre-operational Assessment Process). The operations shall remain shutdown until a mutual restart date is agreed upon by the Contractor, FDF, and DOE.

Short-term shutdown would require the Contractor to shutdown the processing equipment in a safe, controlled manner leaving all equipment, facilities, and/or process areas in a configuration that ensures safety of workers and protection of the environment. Upon entering into a short-term shutdown, the Contractor shall revise the Maintenance Plan to include requirements for inspection and interim maintenance of shutdown equipment (e.g., turning motors and lubrication) to prevent deterioration of equipment and facilitate restart. The Contractor shall perform any required periodic or routine maintenance during the shutdown periods as necessary to protect the equipment and facilitate rapid restart. The Contractor shall also ensure operations and facilities restart without major equipment replacements or maintenance delays.

C.6.2.15.3 Shutdown Mode 3; Long-Term (Greater Than Six Months) or Final Shutdown Prior to Facility Shutdown and Dismantlement

Long-term shutdown will be directed by FDF. This mode of shutdown shall require the Contractor to cease operations for a prolonged period of time, or at the completion of the project prior to facility shutdown and dismantling of the equipment. Operations shall remain shutdown until a mutual restart date and restart approach are agreed upon by the Contractor, FDF, and DOE. The restart of the operations and facilities after a long-term shutdown shall comply with DOE Order 425.1 as discussed in Section C.5.5, Pre-operational Assessment Process.

Long-term shutdown shall require the Contractor to shutdown the processing equipment in a safe, controlled manner to ensure all equipment, facilities, and/or process areas are in a configuration that promotes safety of workers and protection of the environment. Additionally, the internal components of equipment shall be emptied to the extent possible and decontaminated. Waste removed from the treatment process equipment must be managed in accordance with requirements of Section C.6.2.13.5 and the ARARs and TBCs in Attachment J.4.1. During long-term shutdown, except for final shutdown, the Contractor shall revise the Maintenance Plan to include requirements for inspection and interim maintenance of shutdown equipment (e.g., turning motors and lubrication) to prevent deterioration of equipment and facilitate restart. The Contractor shall perform any required periodic or routine maintenance during the shutdown periods as necessary to protect the equipment and facilitate rapid restart. Long-term shutdown, excluding final shutdown, will also ensure operations and facilities restart without major equipment replacements or maintenance delays.

C.6.3 Submittals for Operation and Maintenance

Submittals required for the Operations phase of this project are described in this section. The submittals are summarized in Figures C.4-1 and C.4-2.

C.6.3.1 Remedial Design Package (U.S. EPA and Ohio EPA Submittal)

The RD Package shall be developed according to the requirements of Section C.5.1.4

C.6.3.2 Maintenance Plan

The Maintenance Plan shall be developed according to the requirements of Section 6.2.12.

C.6.3.3 Operations Procedures

Operations procedures shall be developed in accordance with the guidelines contained in Section C.5.4.1.1. Operators shall be trained to these procedures in accordance with the training plan requirements specified in Section C.5.4.1.2. These procedures shall be submitted to FDF for comment and to ensure that they are sufficient to meet the complexities and hazards of the system/facility operation.

C.6.3.4 Operations Records

The following records shall be maintained in accordance with CONOPs procedures by the Contractor and submitted to FDF at the completion of the project or upon request:

- Daily operating logs;
- Laboratory records;
- Personnel training records;
- Maintenance records;
- Work permits (e.g., radiological work permits, confined space entry permits); and
- Inspection logs.

C.6.3.5 Environmental Monitoring Data

Results of environmental monitoring of air, wastewater, stormwater, and solid waste, including stabilized Silo 3 material, performed by the Contractor shall be provided to FDF in accordance with the schedule specified in the SAP.

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